

Notice of Allowability

Application No.

10/080,914

Examiner

William T. Leader

Applicant(s)

HARRIS ET AL.

Art Unit

1742

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the papers filed on August 9, 2005.
2. ☒ The allowed claim(s) is/are 4,5,7,9,11,13,15,16,23,24,28,40,44 and 45.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date 9/2/03; 4/19/04; 8/9/05
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413),
Paper No./Mail Date 9-9-2005
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

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1. The advisory action of September 8, 2005, indicated that the amendment filed on August 9, 2005, would not be entered. The Examiner's Amendment below overcomes the deficiencies noted in the advisory action, and the amendment has been entered.

EXAMINER'S AMENDMENT

2. An extension of time under 37 CFR 1.136(a) is required in order to make an examiner's amendment which places this application in condition for allowance. During a telephone conversation conducted on September 9, 2005, John Wechkin requested an extension of time for one additional MONTH(S) from five to six months and authorized the Director to charge Deposit Account No. 50-0665 the required fee of \$570.00 for this extension and authorized the following examiner's amendment. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

In the Title:

"Method And" has been deleted.

In the Specification:

Paragraph [0002] has been amended as follows:

[0002] 1. U.S. Patent Application No. 10/080,915, titled APPARATUS WITH PROCESSING STATIONS FOR MANUALLY AND AUTOMATICALLY PROCESSING MICROELECTRONIC WORKPIECES (~~Attorney Docket No. 29195.8173US1~~) filed ~~concurrently herewith~~;

Paragraph [0004] has been amended as follows:

[0004] 3. U.S. Patent Application No. 10/080,910, titled MICROELECTRONIC WORKPIECE TRANSFER DEVICES AND METHODS OF USING SUCH DEVICES IN THE PROCESSING OF MICROELECTRONIC WORKPIECES (~~Attorney Docket No. 29195.8153US2~~) ~~filed concurrently herewith,~~ now Patent No. 6,749,391; and

Paragraph [0034] has been amended as follows:

[0034] Figure 2 is a cross-sectional side view of the apparatus 100 described above with reference to Figure 1 in accordance with an embodiment of the invention. In one aspect of this embodiment, at least one of the processing stations 150 can include a vessel 152 configured to provide a processing fluid, such as an electrolytic or electroless processing fluid for metal deposition. A support 160 can be positioned proximate to the vessel 152 and can be configured to receive single microelectronic workpieces 114 and carry the microelectronic workpieces 114 in contact with the processing fluid. Alternatively, the support 160 can be configured to simultaneously carry a plurality of microelectronic workpieces 114. In still further embodiments, the processing station 150 can have other configurations and can carry out other functions, such as rinsing, drying, etching, spraying, measuring, annealing or coating the microelectronic workpieces 114. Further details of stations that perform such functions are included in U.S. Patent Application No. 10/080,715, (~~attorney docket number 29195.8173US1~~),

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previously incorporated herein by reference. Other arrangements for processing stations 150 and supports 160 are included in U.S. Patent Nos. 6,136,163 and 6,139,712, both incorporated herein by reference. In some of the foregoing embodiments, the processing stations 150 do not include vessels, and accordingly, the support 160 can carry the microelectronic workpiece 114 relative to other portions of the processing stations 150.

Paragraph [0047] has been amended as follows:

[0047] In other embodiments, the transfer device 130 can have other configurations. For example, the transfer device 130 can carry a single microelectronic workpiece 114 or more than two microelectronic workpieces 114. When the transfer device 130 carries more than one microelectronic workpiece 114, the motion of each microelectronic workpiece 114 can be at least partially independent, as described above with reference to Figures 4 and 5. Alternatively, the transfer device 130 can be configured to automatically move a plurality of microelectronic substrates 114 together in a batch arrangement, for example, with or without a separate carrier or container configured for use within the enclosure 102. Further details of aspects of transfer devices in accordance with other embodiments of the invention are included in U.S. Patent Application No. 09/875,300, filed June 5, 2001, U.S. Patent Application No. 10/080,910 (~~Attorney Docket No. 29195-8153US2~~), and published PCT Application No. PCT/US99/14414, all incorporated herein by reference.

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In the Claims:

Claims 1-3 have been canceled.

Claim 4 has been rewritten as follows:

4. (currently amended) The apparatus of claim + 15 wherein the transfer device is configured to carry and independently move two microelectronic workpieces.

Claim 5 has been rewritten as follows:

5. (currently amended) The apparatus of claim + 15 wherein the input/output station is configured to support a container carrying a plurality of microelectronic workpieces, with the container being accessible to the transfer device when the container is supported at the input/output station.

Claim 7 has been rewritten as follows:

7. (currently amended) The apparatus of claim + 15 wherein the processing stations are aligned along a generally straight first line and wherein the transfer device includes a robot configured to move along a second line generally parallel to the first line.

Claim 8 has been canceled.

Claim 9 has been rewritten as follows:

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9. (currently amended) The apparatus of claim 1 15, further comprising a shelf carried by the ~~chassis~~ enclosure and positioned to support a container a microelectronic workpieces while the user manually removes the microelectronic workpieces from the container and transfers the microelectronic workpieces to at least one of the processing stations.

Claim 10 has been canceled.

Claim 11 has been rewritten as follows:

11. (currently amended) The apparatus of claim 1 15 wherein the processing stations are arranged along a generally straight first line and wherein the transfer device includes a robot configured to move along a second line generally parallel to the first line, ~~and wherein the apparatus further comprises an enclosure disposed around at least some of the processing stations, the enclosure having an access aperture through which the user can manually access all the processing stations,~~ the second line being positioned between the first line and the access aperture.

Claim 12 has been canceled.

Claim 13 has been rewritten as follows:

13. (currently amended) The apparatus of claim 1 15 wherein the transfer device includes:

a transfer device support having a guide path;

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a base carried by the transfer device support and movable along the guide path;
a lift carried by the base and movable upwardly and downwardly along a lift axis;
an arm carried by the lift, the arm being rotatable relative to the base, the arm having an extension portion projecting away from the lift axis; and
first and second end effectors carried by the arm and rotatably coupled to the extension portion of the arm, with each end effector being independently rotatable relative to the arm and each end effector being configured to releasably carry a microelectronic workpiece.

Claim 14 has been canceled.

Claim 15 has been rewritten as follows:

15. (Currently Amended) An apparatus for processing microelectronic workpieces, comprising;

a plurality of processing stations; ~~wherein at least one of the processing stations includes:~~
~~a processing vessel configured to provide a processing fluid; and~~
~~a support movably positioned proximate to the processing vessel and~~
~~configured to carry the microelectronic workpiece, the support~~
~~being moveable between a process position, a first transferring~~
~~position spaced apart from the process position and a second~~
~~transferring position spaced apart from the process position and the~~

~~first transferring position, wherein the support is oriented to carry the microelectronic workpiece in contact with a processing fluid when the processing fluid is in the vessel and the support is in the process position, the support being oriented to receive the microelectronic workpiece from the transfer device when the support is in the first transferring position, and the support being positioned to receive the microelectronic workpiece manually from the user when the support is in the second transferring position, the support being configured to selectively stop its motion at the first and second transferring positions;~~

an enclosure disposed proximate to at least one of the processing stations, the enclosure having an access aperture positioned to allow manual access to all the processing stations from a single side of the apparatus during operation;

an input/output station configured to support at least one microelectronic workpiece for automatic transfer to and from the processing stations; and a transfer device positioned proximate to the input/output station and the processing stations, the transfer device being automatically movable to transfer microelectronic workpieces between the input/output station and the processing stations[.];

wherein at least one of the processing stations includes:

a processing vessel configured to provide a processing fluid; and

a support movably positioned proximate to the processing vessel and configured to carry the microelectronic workpiece, the support being moveable between a process position, a first transferring position spaced apart from the process position and a second transferring position spaced apart from the process position and the first transferring position, wherein the support is oriented to carry the microelectronic workpiece in contact with a processing fluid when the processing fluid is in the vessel and the support is in the process position, the support being oriented to receive the microelectronic workpiece from the transfer device when the support is in the first transferring position, and the support being positioned to receive the microelectronic workpiece manually from the user when the support is in the second transferring position, the support being configured to selectively stop its motion at the first and second transferring positions.

Claims 18-22 have been canceled.

Claim 23 has been rewritten as follows:

23. (currently amended) The apparatus of claim 21 15 wherein the support includes a carrier extending upwardly from the at least one processing station, an elevator supported by the carrier and movable toward and away from the at least one processing station, and a head carried

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by the elevator, the head having a receiving portion configured to releasably receive the microelectronic workpiece, the head being rotatable relative to the carrier and the at least one processing station.

Claim 24 has been rewritten as follows:

24. (currently amended) The apparatus of claim 24 15 wherein the support is inaccessible to the automatic transfer device when the support is in the second transferring position.

Claims 25-27 have been canceled.

Claim 28 has been rewritten as follows:

28. (currently amended) The apparatus of claim 24 15 wherein the support is ~~movable toward and away from the processing station between the first and second transferring positions,~~ the support being a first distance from the at least one processing station when in the first transferring position, the support being a second distance from the at least one processing station when in the second transferring position, the second distance being greater than the first distance.

Claims 29-36, 38 and 39 have been canceled.

Claim 40 has been rewritten as follows:

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40. (currently amended) The apparatus of claim ~~38~~ 15 wherein the support includes a carrier extending upwardly from the processing vessel, an elevator supported by the carrier and movable toward and away from the at least one processing station, and a head carried by the elevator, the head having a receiving portion configured to releasably receive the microelectronic workpiece.

Claims 41 and 42 have been canceled.

Claim 43 has been rewritten as follows:

43. (currently amended) The apparatus of claim ~~38~~ 15 wherein the support includes a carrier extending upwardly from the at least one processing station, the carrier having an elevator supported by the carrier and movable toward and away from the at least one processing station, and a head carried by the elevator, the head having a receiving portion configured to releasably receive the microelectronic workpiece, and wherein the carrier is carried by a guide device positioned above the at least one processing station, the guide device having a guide path, the carrier being movable toward and away from the at least one processing station along the guide path.

Claim 44 has been rewritten as follows:

44. (currently amended) The apparatus of claim ~~38~~ 15, further comprising a track positioned above the at least one processing station, wherein the support is at least partially

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suspended from the track and is movable along the track toward and away from the at least one processing station.

Claim 45 has been rewritten as follows:

45. (currently amended) The apparatus of claim ~~38~~ 15, further comprising:

a track positioned above the at least one processing station, wherein the support is at least

partially suspended from the track and is movable along the track toward and

away from the at least one processing station; and

a releasable locking mechanism engagable with the support to at least restrict motion of

the support along the track.

Claims 46-72 have been canceled.

COMMENTS

3. In the Information Disclosure Statement filed on August 9, 2005, the Thompson et al (5,168,886), Curtis et al (6,264,752) and Hongo et al (6,716,330) patents were cited. Of these, Thompson et al and Curtis et al are particularly pertinent and are discussed in the Reasons for Allowance. To expedite allowance of patentable subject matter, claims 1-3, 8, 10, 12, 14, 18-22, 25-27, 29-36, 38, 39, 41, 42 and 46-72 have been canceled. Claim 15 has been amended to provide antecedent basis for the expression "the transfer device" in line 15 by rearranging the claim limitations. The specification has been amended to identify applications referred to by

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applicant's docket numbers with serial numbers. The title has been amended to delete the reference to a method since all allowed claims are directed to apparatus.

4. The following is an examiner's statement of reasons for allowance:

The Curtis et al patent illustrates processing tools for processing a microelectronic workpiece such as a semiconductor wafer in figures 11 and 12. The processing tools include a plurality of processing stations 605 disposed along an arcuate or linear path 606, 630. Wafers to be processed are supplied to the tool at input/output station 607. Each processing station may be accessed by at least one robotic arm 610, 625. The robotic arm may transport wafers or housings between the various processing stations. The apparatus includes support members illustrated, for example, as elements 240 in figure 2. The support members clamp the wafer against spacing members 255 (column 6, lines 43-54). Curtis et al do not disclose a processing station with a processing vessel, and a support having the characteristics now recited in claim 15, the support being configured to carry a microelectronic workpiece and movably positioned proximate to the processing vessel.

The Thompspon et al patent is directed to a wafer processor. As shown in figure 1, the processor includes a plurality of receiving bases 51 which may be considered to be processing stations. Semiconductor wafers to be processes are placed within portable module 50 which can then be transferred to one or more of the receiving bases by robotic arm 52. See column 2, lines 19-33. Thompson et al do not disclose a processing station with a processing vessel, and a support having the characteristics now recited in claim 15, the support being configured to carry a microelectronic workpiece and movably positioned proximate to the processing vessel.


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Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William T. Leader whose telephone number is 571-272-1245. The examiner can normally be reached on Mondays-Thursdays and alternate Fridays, 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King, can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


William Leader
September 9, 2005


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